

REMARKS

Claims 1 and 15 have been amended by adding a new limitation for polar solvents, and Claim 15 further amended by adding a new limitation for carbon atoms. Claim 30 has been withdrawn. Claims 3, 9, and 11 have been amended in the same manner as Claim 1. Claim 16 have been amended in the same manner as Claim 15. Upon entry of the amendments, Claims 1, 2, 15, 29, and 35 are pending in this application. Support for the amendments to Claims 1 and 15 for the polar solvents are presented, for example, in the specification at page 56, lines 16-17. Support for the amendments to Claim 15 for the carbon atoms is presented, for example, in the specification at page 54, lines 5-6. Thus, no new matter has been added. Applicants respectfully request entry of the amendments and reconsideration of the present application in view of the amendments and the following remarks.

Request for Rejoinder

Upon allowance of Claim 1, Applicants respectfully request rejoinder of withdrawn Claims 5, 6, 13, 17, 18, 20, 25, 26, 33, 37, and 39 which are ultimately dependent on Claim 1 and include all of the limitations of Claim 1.

Claim Rejections – 35 U.S.C. § 103

Claims 1, 2, 15, 29, and 35 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 2002-334618 A (“‘618”). Applicants respectfully submit that pending claims are allowable over ‘618 because ‘618 fails to suggest several of the recited elements, as discussed below.

Although a machine translation of the cited reference is used by the Examiner, the certified partial English translation of JP 2002-334618 A is submitted herewith and is referred to in this response as the English language equivalent.

‘618 teaches such a process for formation of conductive metal thin film using fine metal particle dispersion, which metal thin film is substitutionally used for a metal plating film.

The fine metal particle dispersion used in the process is such a dispersion comprising an organic solvent that is used as a dispersion medium and a fine metal particle having an average particle size selected in the range of 1 to 100 nm, which particle is dispersed in the organic

solvent, wherein the surface of the fine metal particle being dispersed therein is coated with one or more compounds having a group containing a nitrogen atom, an oxygen atom or a sulfur atom, which group is used as a group capable of forming a coordinative bond with a metal element contained in the fine metal particles. (See Claim 1 of '618) In the fine metal particle dispersion, the content of the organic solvent that is used as the dispersion medium is preferably selected in the range of 5 to 100 parts by mass based on 100 parts by mass of the fine metal particle. (See paragraph [0036] of the Description of '618)

At least, the paragraph [0036] of the Description of '618 contains no description as to the content of one or more compounds having a group containing a nitrogen atom, an oxygen atom or a sulfur atom, which group is used as a group capable of forming a coordinative bond with a metal element contained in the fine metal particles.

Further, '618 fails to provide any suggestion as to the specific choice of the one or more compounds having a group containing a nitrogen atom, an oxygen atom or a sulfur atom such that "said one or more compounds having a group containing a nitrogen atom, an oxygen atom or a sulfur atom is selected from the group consisting of diamine compounds having an alkyl substituent on one of two amino groups, hydroxyamine compounds having an O-alkyl substituent, and monoamines containing a branched alkyl group".

'618 also fails to provide any suggestion as to the specific choice of the thickness of the covering layer formed with the adjusted covering amount such that "a thickness of the covering layer formed with the adjusted covering amount is at least 0.5 nm or thicker, and selected in the range of 2/10 to 8/10 of the average particle size of the fine metal particles".

The fine metal particle dispersion used in the process of '618 may further comprise a compound having reactivity to the group containing a nitrogen atom, an oxygen atom or a sulfur atom, which group is used as a group capable of forming a coordinative bond with a metal element contained in the fine metal particles in the one or more compounds having the group containing a nitrogen atom, an oxygen atom or a sulfur atom, with which compounds the fine metal particle being dispersed is coated.

Therefore, the compound having reactivity to the group containing a nitrogen atom, an oxygen atom or a sulfur atom is used to accelerate removal of the one or more compounds having

the group containing a nitrogen atom, an oxygen atom or a sulfur atom from the surface of the fine metal particle when the heating-up treatment is carried out.

Accordingly, the compound having reactivity to the group containing a nitrogen atom, an oxygen atom or a sulfur atom is by no means used for formation of the coating thereof on the surface of fine metal particle being dispersed in the fine metal particle dispersion.

Further, a carboxyl group (-COOH) that is a functional group contained in carboxylic acid is a group containing two oxygen atoms therein, but is by no means considered to be a group containing one oxygen atom therein. The moiety of carboxylic acid anhydride (i.e. -CO-O-CO-) is a moiety containing three oxygen atoms therein, but is by no means considered to be a moiety containing one oxygen atom therein.

Therefore, '618 fails to provide any suggestion as to such a fine metal particle dispersion comprising fine metal particles that are covered with one or more carboxylic acids capable of forming a metal salt with metal contained in the fine metal particles.

In addition, '618 fails to provide any suggestion such that carboxylic acid would be one of "compounds having a group containing a nitrogen atom, an oxygen atom or a sulfur atom and capable of forming a coordinative bond via a lone pair of said atom as a group capable of forming a coordinative bond with a metal element contained in the fine metal particles". At least, in paragraphs [0029] to [0031] of '618, '618 clearly described that the organic acid anhydride or derivative thereof or the organic acid is used as the compound having reactivity to the group containing a nitrogen atom, an oxygen atom or a sulfur atom.

Further, '618 fails to provide any suggestion as to the specific choice of the one or more carboxylic acids forming the covering layer such that "said one or more carboxylic acids is selected from the group of consisting of long chain carboxylic acids having 8 or more carbon atoms in the form of linear carboxylic acid, which carbon atoms are chosen in the range of 18 carbon atoms or less".

'618 also fails to provide any suggestion as to the specific choice of the thickness of the covering layer formed with the adjusted covering amount such that "a thickness of the covering layer formed with the adjusted covering amount is at least 0.5 nm or thicker, and selected in the range of 2/10 to 8/10 of the average particle size of the fine metal particles"

In addition, '618 teaches just a fine metal particle dispersion comprising fine metal particles that is coated with one or more compounds having a group containing a nitrogen atom, an oxygen atom or a sulfur atom. Thus '618 teaches just fine metal particles being dispersed in the organic solvent, which is considered to be fine metal particles in the wet form. Accordingly, '618 fails to provide any suggestion as to such fine metal oxide particles in the form of a dry powder.

One of the distinctive features of the invention of the fine mental particles as claimed in currently amended Claims 1, 2 and 15 is such a feature that the claimed fine mental particles is just "fine metal particles in the form of a dry powder" in which "a thickness of the covering layer formed with the adjusted covering amount is at least 0.5 nm or thicker, and selected in the range of 2/10 to 8/10 of the average particle size of the fine metal particles".

Therefore, '618 teaches just fine metal particles in wet form being dispersed in a dispersion solvent, in which a thickness of the covering layer is by no means adjusted to such a well-adjusted thickness. Accordingly, such distinctive features of the invention of the fine mental particles as claimed in currently amended Claims 1, 2 and 15 are by no means obvious over '618.

In addition, in paragraph [0036] of '618, '618 described that "The content of said organic solvent is chosen based on the quantity of the compound which has reactivity to the compound having the group containing the nitrogen, oxygen, or sulfur atom, for example, the organic acid anhydride, derivative thereof, or organic acid, which it should dissolve. "However, '618 fails to provide any suggestion such that the content of the compound having the group containing the nitrogen, oxygen, or sulfur atom is directly related to the content of said organic solvent.

In view of this fact, the Examiner's assertion based on "machine translation" of paragraph [0036] is quite unreasonable.

Referring to "Patent Abstracts of Japan" of JP 2002-334618A, the Abstract of '618 clearly described that "a coating film is put under heat treatment at 250°C or less to manufacture a metal film with metal extra-fine particles densely sintered." At least, the Abstract of '618 fails to suggest that "a coating film is put under heat treatment at 250°C or less to prepare the particles in the form of dry powder, rather than the metal film made of metal extra-fine particles densely sintered.

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CONCLUSION

In the light of the applicant's amendments to the claims and the foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

No Disclaimers or Disavowals

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made to facilitate expeditious prosecution of this application. Applicant reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history shall not reasonably infer that Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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